



SEQUENCE LISTING

(1) GENERAL INFORMATION:

- (i) APPLICANT: HOFMANN, Joachim  
SCHMID, Karlheinrich  
PAULI, Annette
- (ii) TITLE OF INVENTION: DICTYOCAULUS VIVIPARUS ANTIGEN FOR THE  
DIAGNOSIS OF LUNGWORM INFESTATION AND FOR VACCINATION
- (iii) NUMBER OF SEQUENCES: 30
- (iv) CORRESPONDENCE ADDRESS:  
(A) ADDRESSEE: FOLEY & LARDNER  
(B) STREET: 3000 K Street, N.W.  
(C) CITY: Washington  
(D) STATE: D.C.  
(E) COUNTRY: U.S.A.  
(F) ZIP: 20007-5109
- (v) COMPUTER READABLE FORM:  
(A) MEDIUM TYPE: Floppy disk  
(B) COMPUTER: IBM PC compatible  
(C) OPERATING SYSTEM: PC-DOS/MS-DOS  
(D) SOFTWARE: PatentIn Release #1.0, Version #1.30
- (vi) CURRENT APPLICATION DATA:  
(A) APPLICATION NUMBER: US 09/403,092  
(B) FILING DATE: 15-OCT-1999  
(C) CLASSIFICATION:
- (vii) PRIOR APPLICATION DATA:  
(A) APPLICATION NUMBER: WO PCT/EP98/02090  
(B) FILING DATE: 09-APR-1998
- (vii) PRIOR APPLICATION DATA:  
(A) APPLICATION NUMBER: DE 197 15 586.3  
(B) FILING DATE: 15-APR-1997
- (viii) ATTORNEY/AGENT INFORMATION:  
(A) NAME: Granados, Patricia D.  
(B) REGISTRATION NUMBER: 33,683  
(C) REFERENCE/DOCKET NUMBER: 038311/0103
- (ix) TELECOMMUNICATION INFORMATION:  
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(2) INFORMATION FOR SEQ ID NO:1:

- (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 7 amino acids  
(B) TYPE: amino acid  
(C) STRANDEDNESS:  
(D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:1:

Ser Glu Ser Leu Tyr Glu Lys  
1 5

(2) INFORMATION FOR SEQ ID NO:2:

(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 7 amino acids  
(B) TYPE: amino acid  
(C) STRANDEDNESS:  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

Met Met Asp Asn Phe Val Lys  
1 5

(2) INFORMATION FOR SEQ ID NO:3:

(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 14 amino acids  
(B) TYPE: amino acid  
(C) STRANDEDNESS:  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

Tyr Lys Asp Glu Asn Glu Phe Met Asp Ala Leu Lys Gln Lys  
1 5 10

(2) INFORMATION FOR SEQ ID NO:4:

(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 20 amino acids  
(B) TYPE: amino acid  
(C) STRANDEDNESS:  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:4:

Tyr Asp Ile Pro Glu Gln Tyr Arg Glu Ile Ile Pro Gln Asn Val Ala  
1 5 10 15  
Glu His Leu Lys  
20

(2) INFORMATION FOR SEQ ID NO:5:

- (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 26 amino acids  
 (B) TYPE: amino acid  
 (C) STRANDEDNESS:  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

Asp Ala Ile Glu Lys Tyr Glu Asp Ile Pro Glu Gln Tyr Arg Glu Ile  
1                    5                    10                    15  
  
Ile Pro Gln Asn Val Ala Glu His Leu Lys  
                    20                    25

(2) INFORMATION FOR SEQ ID NO:6:

- (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 18 amino acids  
 (B) TYPE: amino acid  
 (C) STRANDEDNESS:  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:6:

Phe His Ala Glu Leu Leu Ala Gly Ile Lys Pro Ser Leu Glu Glu Leu  
1                    5                    10                    15  
  
Lys Lys

(2) INFORMATION FOR SEQ ID NO:7:

- (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 14 amino acids  
 (B) TYPE: amino acid  
 (C) STRANDEDNESS:  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:7:

Gln Phe Pro Ile Leu Thr Ser Val Phe Ser Asn Glu Glu Lys  
1                    5                    10

(2) INFORMATION FOR SEQ ID NO:8:

- (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 21 base pairs

(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(ix) FEATURE:

(A) NAME/KEY: exon  
(B) LOCATION: 1..21

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:8:

TCNGARUCNY TNTAYGARAA R

21

(2) INFORMATION FOR SEQ ID NO:9:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 21 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(ix) FEATURE:

(A) NAME/KEY: exon  
(B) LOCATION: 1..21

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:9:

ATGATGGAYA AYTTYGTNAA R

21

(2) INFORMATION FOR SEQ ID NO:10:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 42 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(ix) FEATURE:

(A) NAME/KEY: exon  
(B) LOCATION: 1..42

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:10:

TAYAARGAYG ARAAYGARTT YATGGAYGCN YTNAARCARA AR

42

(2) INFORMATION FOR SEQ ID NO:11:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 60 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(ix) FEATURE:  
 (A) NAME/KEY: exon  
 (B) LOCATION: 1..60

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:11:  
 TAYGAYATHC CNGARCARTA YMGNGARATH ATHCCNCARA AYGTCNGCNGA RCAYYTNAAR 60

(2) INFORMATION FOR SEQ ID NO:12:

(i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 78 base pairs  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(ix) FEATURE:  
 (A) NAME/KEY: exon  
 (B) LOCATION: 1..78

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:12:  
 GAYGCNATHG ARAARTAYGA RGAYATHCCN GARCARTAYM GNGARATHAT HCCNCARAAY 60  
 GTNGCNGARC AYYTNAAR 78

(2) INFORMATION FOR SEQ ID NO:13:

(i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 54 base pairs  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(ix) FEATURE:  
 (A) NAME/KEY: exon  
 (B) LOCATION: 1..54

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:13:  
 TTYCAYGCNG ARYTNYTNGC NGGNATHAAR CCNTCNYTNG ARGARYTNAA RAAR 54

(2) INFORMATION FOR SEQ ID NO:14:

(i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 42 base pairs  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(ix) FEATURE:  
    (A) NAME/KEY: exon  
    (B) LOCATION: 1..42

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:14:

CARTTYCCNA THYTNACNTC NGTNTTYTCN AAYGARGARA AR

42

(2) INFORMATION FOR SEQ ID NO:15:

(i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 29 base pairs  
    (B) TYPE: nucleic acid  
    (C) STRANDEDNESS: single  
    (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(ix) FEATURE:  
    (A) NAME/KEY: exon  
    (B) LOCATION: 1..29

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:15:

CCGGAATTTCG AYGCNATNGA RAARTAYGA

29

(2) INFORMATION FOR SEQ ID NO:16:

(i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 7 amino acids  
    (B) TYPE: amino acid  
    (C) STRANDEDNESS:  
    (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:16:

Asp Ala Ile Glu Lys Tyr Glu  
1                    5

(2) INFORMATION FOR SEQ ID NO:17:

(i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 29 base pairs  
    (B) TYPE: nucleic acid  
    (C) STRANDEDNESS: single  
    (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(ix) FEATURE:  
    (A) NAME/KEY: exon  
    (B) LOCATION: 1..29

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:17:

CGCGGATCCG ARATNATNCC NCARAAYGT

29

(2) INFORMATION FOR SEQ ID NO:18:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 7 amino acids
  - (B) TYPE: amino acid
  - (C) STRANDEDNESS:
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:18:

Glu Ile Ile Pro Gln Asn Val  
1 5

(2) INFORMATION FOR SEQ ID NO:19:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 29 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(ix) FEATURE:

- (A) NAME/KEY: exon
- (B) LOCATION: 1..29

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:19:

CCGGAATTCT AYAARGAYGA RAYGARTT

29

(2) INFORMATION FOR SEQ ID NO:20:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 7 amino acids
  - (B) TYPE: amino acid
  - (C) STRANDEDNESS:
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:20:

Tyr Lys Asp Glu Asn Glu Phe  
1 5

(2) INFORMATION FOR SEQ ID NO:21:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 31 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(ix) FEATURE:

- (A) NAME/KEY: exon
- (B) LOCATION: 1..31

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:21:

AAAACGCGAG NGCCTCCATG AATCTCTTTC C

31

(2) INFORMATION FOR SEQ ID NO:22:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 7 amino acids
  - (B) TYPE: amino acid
  - (C) STRANDEDNESS:
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:22:

Ala Asp Met Phe Glu Asn Glu  
1 5

(2) INFORMATION FOR SEQ ID NO:23:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 31 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(ix) FEATURE:

- (A) NAME/KEY: exon
- (B) LOCATION: 1..31

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:23:

AAAACGCGAG YTTYTCYTCT TCTCTAANA C

31

(2) INFORMATION FOR SEQ ID NO:24:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 7 amino acids
  - (B) TYPE: amino acid
  - (C) STRANDEDNESS:



(D) TOPOLOGY: linear  
(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:24:

Lys Glu Glu Asn Ser Phe Val  
1 5

(2) INFORMATION FOR SEQ ID NO:25:

(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 32 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(ix) FEATURE:  
(A) NAME/KEY: exon  
(B) LOCATION: 1..32

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:25:

GACATGCATG TAGACGCACT TGGAGAAGAG GC

32

(2) INFORMATION FOR SEQ ID NO:26:

(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 8 amino acids  
(B) TYPE: amino acid  
(C) STRANDEDNESS:  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:26:

Val Asp Ala Leu Gly Glu Glu Ala  
1 5

(2) INFORMATION FOR SEQ ID NO:27:

(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 36 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(ix) FEATURE:  
(A) NAME/KEY: exon  
(B) LOCATION: 1..36

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:27:

CCGGAATTCC CTGAACAGTA CAGAGAGATC ATTCCA

36

(2) INFORMATION FOR SEQ ID NO:28:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 9 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:28:

Pro Glu Gln Tyr Arg Glu Ile Ile Pro  
1 5

(2) INFORMATION FOR SEQ ID NO:29:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 562 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(ix) FEATURE:

- (A) NAME/KEY: exon
- (B) LOCATION: 1..562

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:29:

TGGAGAARTA CGAAGATATT CCTGAACAGT ACAGAGAGAT CATTCCACAA AACGTGGCCG	60
AGCATTTAAA ATCGATAACT GAGGAAGAGA AAAAAGTGCT CAAAGAATTT GTTAAAGACT	120
ATGCAAAATA CAAAGATGAA AATGAGTTCA TGGACGCATT AAAGCAAAAA TCTGAAAGCC	180
TTTATGAGAA AGCTAAAAAA CTTCAAGATT TGCTGAAATC AAAAGTAGAC GCACTTGGAG	240
AAGAGGCAAA ACAATTTGTG ATGAAGCTTA TCGCTGAGGC TCGTAAATTC CACGCAGAGC	300
TACTGGCCGG CATCAAACCA TCGCTAGAAG AACTAAAAGC CGTCGCTAAA AAGCATATTG	360
AAGAGTTTGA GAAGTTATCA GATGCAGCTA AAGATGATTT CAAAAAGCAA TTCCCTATCC	420
TCACATCCGT GTTCAGCAAT GAAAAAGCAA AGAAAATGAT GGACAACTTT GTGAAAAATT	480
AAAGTTGTAT GATTTGCAGG ATATGAAATA AATGTTAAAT TGAAAAAAAA AAAAAAAAAA	540
AAAAAAAAAA AAAAAAAAAA AG	562

(2) INFORMATION FOR SEQ ID NO:30:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 159 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:30:

B /

Glu	Lys	Tyr	Glu	Asp	Ile	Pro	Glu	Gln	Tyr	Arg	Glu	Ile	Ile	Pro	Gln	
1				5					10					15		
Asn	Val	Ala	Glu	His	Leu	Lys	Ser	Ile	Thr	Glu	Glu	Glu	Lys	Lys	Val	
			20					25					30			
Leu	Lys	Glu	Phe	Val	Lys	Asp	Tyr	Ala	Lys	Tyr	Lys	Asp	Glu	Asn	Glu	
		35					40					45				
Phe	Met	Asp	Ala	Leu	Lys	Gln	Lys	Ser	Glu	Ser	Leu	Tyr	Glu	Lys	Ala	
	50					55					60					
Lys	Lys	Leu	Gln	Asp	Leu	Leu	Lys	Ser	Lys	Val	Asp	Ala	Leu	Gly	Glu	
65					70					75					80	
Glu	Ala	Lys	Gln	Phe	Val	Met	Lys	Leu	Ile	Ala	Glu	Ala	Arg	Lys	Phe	
				85					90					95		
His	Ala	Glu	Leu	Leu	Ala	Gly	Ile	Lys	Pro	Ser	Leu	Glu	Glu	Leu	Lys	
			100					105						110		
Ala	Val	Ala	Lys	Lys	His	Ile	Glu	Glu	Phe	Glu	Lys	Leu	Ser	Asp	Ala	
		115					120					125				
Ala	Lys	Asp	Asp	Phe	Lys	Lys	Gln	Phe	Pro	Ile	Leu	Thr	Ser	Val	Phe	
	130					135					140					
Ser	Asn	Glu	Lys	Ala	Lys	Lys	Met	Met	Asp	Asn	Phe	Val	Lys	Asn		
145					150					155						